

EXPLANATION OF SIGNIFICANT DIFFERENCES
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FOR THE HANFORD SITE 100 K AREA K BASINS INTERIM REMEDIAL ACTION
RECORD OF DECISION

MAY 2016

INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

This decision document presents an Explanation of Significant Differences (ESD) for the Hanford Site 100 K Area K Basins Interim Remedial Action Record of Decision (ROD). The U.S. Department of Energy (DOE) 100 K Area site is located in Benton County, Washington.

The 100 Area of the Hanford Site, which encompasses approximately 68 km² (26 mi²) bordering the south shore of the Columbia River, is the site of nine retired plutonium production reactors. Two of the reactors (K East and K West) reside in the 100-KR-2 Operable Unit within the 100-K Area. Spent nuclear fuel (SNF) storage basins (i.e., the K Basins) were constructed adjacent to each of these reactors. The K Basins are: (1) 105-K East Basin (which has been deactivated, demolished and removed) and (2) 105-K West Basin (which presently contains consolidated radioactive sludge which is the subject of this ESD).

The K Basins interim remedial action in the 100 Area of the Hanford Site is being conducted under CERCLA § (42 U.S.C. 9601 et. seq.). A 1999 ROD (EPA 1999) selected as the interim remedial action: the removal of SNF, sludge, water, and debris from the K Basins, and the treatment and disposal of non TRU sludge. The ROD was amended in 2005 to require treatment and disposal of the TRU sludge and to allow grouting of debris located in the K Basins.

The basis for the decisions provided in this Document is as follows:

The 1999 ROD directed TRU sludge to be removed from K Basins and placed in storage pending further treatment, with treatment not included within the scope of the ROD. The 2005 ROD amendment eliminated extended storage of untreated TRU sludge, required the sludge to be treated for disposal, and required that the treated TRU sludge be delivered to a national repository for disposal.

Due to delays, a new Hanford Federal Facility Agreement and Consent Order (HFFACO), Tri-Party Agreement milestone was added for installation of sludge removal equipment as part of the settlement of a penalty enforcement action taken by the U.S. Environmental Protection Agency (EPA) to address a missed milestone for sludge removal. New milestone due dates for K Basins sludge removal and for selection of the sludge treatment and packaging technology were also established. Under the new milestones, the due date for completion of sludge removal from 105-KW Basin occurs nearly three years before the due date for selection of the treatment and packaging technology. As a result, longer term storage of untreated sludge than previously anticipated will be necessary.

Since the 2005 ROD amendment, DOE has obtained additional information regarding sludge properties and has completed additional design work for the proposed storage in the T-Plant canyon cells. The additional information includes the following: (1) sludge transport system (STS) cask venting, STS cask purging, and sludge transport and storage container (STSC) purging at T Plant, (2) thermal and gas generation rate analyses for storage of STSCs containing K Basin sludge at T Plant, (3) evaporative water loss from the STSCs during storage at T Plant, and (4) the potential for K Basin sludge to freeze during storage at T Plant. This information

will be used to facilitate safe storage of untreated sludge at T Plant until the treatment and packaging technology is selected and new treatment and packaging milestones are developed.

STATUTORY CITATION FOR AN EXPLANATION OF SIGNIFICANT DIFFERENCES

DOE and EPA are issuing this ESD in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(i) of the NCP. The purpose of this ESD is to provide public notice of a change to the selected interim remedial action that will allow longer term storage of untreated K Basins sludge at T Plant. All work associated with T Plant in support of sludge disposition will be completed pursuant to the requirements set forth in the Remedial Design Report/Remedial Action Work Plans (RDR/RAWP). In accordance with 40 CFR 300.435(c)(2)(i)(A) and 40 CFR 300.825(a)(2), this ESD and supporting documents for the ESD, will become part of the 100 K Area K Basins Interim Remedial Action Administrative Record. The ESD and supporting information for the ESD are available at [Department of Energy Tri-Party Agreement Administrative Record \(AR\) office and at the Public Information Repositories \(PIR\) identified below](#). It is also available at <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1505270503> and the following locations:

U.S. Department of Energy, Richland Operations Office

Administrative Record

2440 Stevens Center, Room 1101

P.O. Box 950, Mail Stop H6-08

Richland, WA 99352

(509) 376-2530

E-Mail: Heather_M_Childers@rl.gov

Hours of Operation: Monday through Thursday 6:00 am – 4:30 pm (except 12:00 – 1:00 pm)

Public Access Room

2440 Stevens Center, Room 1101

P.O. Box 950, Mail Stop H6-08

Richland, WA 99352

(509) 376-2530

E-Mail: Heather_M_Childers@rl.gov

Hours of Operation: Monday through Thursday 6:00 am – 4:30 pm (except 12:00 – 1:00 pm)

Gonzaga University

Foley Center Library

East 502 Boone Avenue

Spokane, WA 99258

(509) 313-6110

E-Mail: spenceratkins@gonzaga.edu

Hours: (January 11-May 8, 2016)
Monday-Thursday, 7:30am-2pm, Friday 7:30 am-9 pm
Saturday 10 am – 6 pm, Sunday, 10 am – 2 am
<http://researchguides.gonzaga.edu/hours>

Portland State University Library

Government Information
Branford Price Millar Library – LIBW
PO Box 1151
Portland, OR 97207
(503) 725-4542
E-Mail: westonc@pdx.edu
Hours: Monday – Thursday 7:30 am – 12 am, Friday 7:30 am – 7 pm
Saturday 10 am – 7 pm
Sunday 12 pm – 12 am
<http://library.pdx.edu/about/hours>

University of Washington

Suzzallo & Allen Libraries
University of Washington
P.O. Box 352900
Seattle, WA 98185
(206) 543-5597 or (206) 543-4164
Hours: Winter Quarter (January 4 – March 18, 2016)
Monday – Thursday 7:30 am – 10 pm
Friday 7:30 am – 6 pm
Saturday 1 – 5 pm
Sunday 1 – 10 pm
E-Mail: govpub@uw.edu
Website: http://www.lib_washington.edu/about/hours/suzzallo

U.S. Department of Energy Public Reading Room

Washington State University
Consolidated Information Center, Room 101-L
2770 University Drive
Richland, WA 99352
(509) 375-7443
Monday – Thursday 12 pm – 4 pm
E-Mail: doe.reading.room@pnnl.gov

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The 1999 K Basins Interim Action ROD directed removal of SNF, sludge, water and debris from the two K Basins in the 100 K Area. As concerns sludge, which is the subject of this ESD, the 1999 ROD required sludge to be separated into TRU and non TRU fractions as it is removed to the extent practicable, with non TRU sludge transported to ERDF, treated to meet waste acceptance criteria and disposed, and with TRU sludge placed in storage in a permitted storage and treatment facility in 200 Area; the 1999 ROD did not include treatment for TRU sludge within its scope. It indicated that the interim remedial action would be complete upon receipt of the TRU sludge at the storage and treatment facility.

In 2005, the 1999 ROD was amended to modify the selected interim remedy for sludge and a portion of the debris in the bottom of the K Basins. The amendment required the removed TRU sludge to be treated, packaged for disposal, interim stored pending shipment, and shipped to a national repository. The amendment required the sludge to be treated to prepare it for disposal at a national repository and to place it in a safer state for interim storage. This amendment was based on availability of additional information on both the physical/radiological characteristics of the sludge and the treatment requirements for disposal of TRU sludge at a national repository. The amended ROD requires the details of the treatment methodology to be provided in the remedial design/remedial action work plan (RD/RAWP)¹. The amended ROD also provided for short-term contingency storage of untreated, containerized sludge at a 200 Area facility while awaiting transfer to a treatment facility.

Consistent with the amended ROD, the sludge retrieval and loadout RD/RAWP for implementation of the amended ROD was modified to allow the untreated sludge to be transported to T Plant or other appropriate 200 Area waste management facility for short-term storage. However, the amended ROD did not identify T Plant as being onsite for purposes of Section 104 of CERCLA, meaning the storage would have to comply with all substantive and administrative regulatory requirements applicable to such storage.

Due to delays in sludge removal from the 105-K West Basin, a new milestone² was established for installation of sludge removal equipment as part of a settlement agreement with EPA. Existing milestones for removal of sludge from the 105-K West Basin and selection of K Basin sludge treatment and packaging technology were also extended to align with treatment of other large container remote-handled transuranic wastes. These new and modified milestones will result in a need for longer term interim storage at T Plant prior to treatment because the new due

¹ There are two RD/RAWPs for implementing management of K Basins sludge: (1) DOE/RL-2010-63, which addresses retrieval and loadout of untreated sludge followed by transport to T Plant or other appropriate 200 Area waste management facility; and (2) DOE/RL-2011-15, which was developed after the 2005 amendment to address treatment and packaging of sludge, followed by transport to an interim storage facility pending disposal at a national repository.

² M-016-177, *Complete 105-KW sludge transfer equipment installation*.

date for completion of sludge removal from 105-KW Basin will occur nearly three years before the new due date for selection of K Basin sludge treatment and packaging technology.

DESCRIPTION OF SIGNIFICANT DIFFERENCES

The amended ROD modified the remedy for sludge by including sludge treatment prior to interim storage and required TRU sludge to be treated and packaged for disposal, and shipped off Hanford to a national repository for disposal. This ESD modifies the amended ROD by removing the requirement that sludge be treated prior to interim storage, provided the sludge is stored at T-Plant in Cells 3L, 8R, 9L, 10L, 13L 14R, and 15L. The sludge remains subject to the requirement that it be treated and packaged for disposal, and shipped off-Hanford to a national repository. The ARARs included in the amended ROD for sludge management, storage, treatment and disposal will be met.

Although the delays in sludge removal result in increased cost, including increased cost for storage of untreated sludge at T Plant, the changes provided by this ESD do not fundamentally alter the overall interim remedial action with respect to scope, performance, or cost.

The Tri-Parties have confirmed that T Plant is capable of providing interim storage of untreated sludge in a manner protective of human health and the environment as part of the K Basins remedial action. Safety studies³ that include analyses of sludge properties (such as engineering reports regarding gas generation, retrievability, and other conditions that would affect the safe storage for a longer period of time) have been performed for the interim storage of untreated sludge at T Plant. Safe sludge storage will be achieved through requirements for receipt, handling, and storage of sludge transport system (STS) casks and sludge transport and storage containers (STSCs) containing K Basin sludge materials.

Both the RD/RAWP for sludge retrieval and loadout and the RD/RAWP for sludge treatment and packaging will be modified to address receipt and storage of sludge at T Plant as part of the remedy. The RD/RAWP for sludge treatment and packaging will be modified to also describe how storage of sludge at T Plant will satisfy ARARs identified in the amended ROD, including 40 CFR 761.50(c), which requires that PCB waste must be stored in accordance with 40 CFR 761.65. Details will be provided in the RD/RAWP to address management of any secondary wastes that may be generated from spill(s) and/or contamination of surfaces and/or equipment within T Plant in accordance with cleanup standards for PCB remediation waste. The potential for air emissions from sludge storage at T Plant has been evaluated and it has been determined that the existing exhaust and monitoring system will be able to abate any emissions in

³ Detailed information on safety studies associated with untreated sludge is provided in the administrative record in the following documents: PRC-STP-00241, Revision 2, *Sludge Treatment Project-Engineered Container Retrieval and Transfer System – Thermal and Gas Analyses for Sludge Transport and Storage Container (STSC) Storage at T Plant*; PRC-STP-00579, Revision 1, *Sludge Treatment Project Engineered Container Retrieval and Transfer System: Status Report for Long Term Monitoring of K Basin Sludge Samples*; and PRC-STP-TR-00482, Revision 0, *Test Report for Sludge Treatment Project Engineered Container Retrieval and Transfer System Aged Sludge Retrieval Test*.

accordance with ARARs for controlling emissions, including the National Emission Standards for Hazardous Pollutants. Details will be provided in the RD/RAWP.

A summary of the differences between the 2005 remedy and the modified ESD remedy is shown in Table 1.

Table 1. Comparison of TRU Sludge Remedy as Modified by 2005 ROD Amendment (2005 remedy) and TRU Sludge Remedy as Modified by this ESD

Element	2005 Remedy(Sludge Treatment and Packaging After Removal from 105-K West Basin)	Modified ESD Remedy (provides for longer term Sludge Storage at T Plant Prior to Treatment)
Storage of Untreated Sludge	Provided for short-term, contingency storage of untreated but containerized sludge while awaiting transfer to treatment facility.	<p>Untreated TRU sludge will be stored at T Plant for an extended period in accordance with ARARs.</p> <p>Untreated sludge will be stored at T Plant under the “nuclear safety requirements” established in accordance with Title 10, Code of Federal Regulations, Part 830 (10 CFR 830) “Nuclear Safety Management”.</p> <ul style="list-style-type: none"> • Proper sludge composition stored in each STSC will be verified; • Proper sludge volumes and STSC configurations will be verified; • STSC headspace vent/purge requirements will be verified; • Installation of an STSC vent pipe on each STSC during storage at T Plant will be verified; • Monitoring and replenishment of the water level in stored STSCs will be verified as needed.

Table 1. Comparison of TRU Sludge Remedy as Modified by 2005 ROD Amendment (2005 remedy) and TRU Sludge Remedy as Modified by this ESD

Element	2005 Remedy(Sludge Treatment and Packaging After Removal from 105-K West Basin)	Modified ESD Remedy (provides for longer term Sludge Storage at T Plant Prior to Treatment)
Identification of Storage Location	Provided for short-term storage of untreated but containerized sludge at a 200 Area storage facility while awaiting transfer to treatment facility.	Selects T Plant as storage location and, in accordance with CERCLA, Section 104(d)(4), identifies T-Plant Cells 3L, 8R, 9L, 10L, 13L, 14R, and 15L as onsite for response purposes.
Compliance with ARARs	Requires compliance with identified ARARs for waste management and for controlling emissions to the environment, including 40 CFR 761.65 ⁴ standards for storage of PCB waste, which includes closure requirements, and 40 CFR 61.92 for abatement of emissions of radionuclides, and 40 CFR 61.93 for measurement of emissions.	No change

The changes made by this ESD do not fundamentally alter the selected remedy described in the 100 K Area K Basins Interim Remedial Action ROD, as amended. The significant difference is that TRU sludge can be stored for an extended period at T Plant prior to treatment in accordance with ARARs and controls specified above.

SUPPORT AGENCY COMMENTS

Ecology, as the support agency, concurs with this ESD to the Hanford Site 100 K Area K Basins Interim Remedial Action Record of Decision.

All of T Plant is not identified for interim sludge storage, T Plant Cells 3L, 8R, 9L, 10L, 13L, 14R, and 15L, are part of this CERCLA interim remedial action. No mixing of Dangerous Waste permitted areas and CERCLA interim remedial action areas are authorized by this ESD. Any modification to RCRA permitted areas pursuant to any work under this ESD outside the T-Plant Cells 3L, 8R, 9L, 10L, 13L, 14R, and 15L are governed by the Hanford Dangerous Waste permit, or other applicable regulations.

⁴ This requirement is identified in both the 1999 ROD and the 2005 ROD amendment as 40 CFR 761.50(c), *Storage for Disposal*, which states, “Any person who holds PCB waste must store it in accordance with 761.65.”

STATUTORY DETERMINATIONS

The remedy, as revised by this ESD, continues to satisfy the requirements of CERCLA Section 121. The revised remedy is protective of human health and the environment, will comply with the federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

The preamble to the NCP clarifies that when noncontiguous facilities are reasonably close to one another and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. The 105-K West Basin, the Environmental Restoration Disposal Facility, and T Plant Cells 3L, 8R, 9L, 10L, 13L, 14R, and 15L are considered to be a single site for response purposes under the Hanford Site 100 K Area K Basins Interim Remedial Action Record of Decision, as amended and modified.

PUBLIC PARTICIPATION

The public participation requirements set forth in 40 CFR 300.435(c)(2)(i) of the NCP are met through the issuance of this ESD, and associated informational sheet, and through notification to the public via newspaper publication briefly summarizing the ESD, including the reasons for the differences, placed in the *Tri-City Herald*.

REFERENCES

40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” *Code of Federal Regulations*, as amended.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980,
42 U.S.C. 9601, et seq.


EPA, 1999, EPA/ROD/R10-99/059, *Record of Decision: HANFORD 100-AREA (USDOE)*, EPA ID WA3890090076, OU 29, Benton County, Washington, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2005, *U.S. Department of Energy, 100 K Area K Basins, Hanford Site – 100 Area, Benton County, Washington; Amended Record of Decision, Decision Summary and Responsiveness Summary*, U.S. Environmental Protection Agency, Washington, D.C.

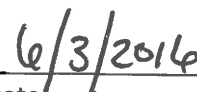
Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq., as amended.

May 2016

Signature sheet for the *Explanation of Significant Differences for the 1999 Amended Record of Decision for the K Basins* between the U.S. Department of Energy and the U.S. Environmental Protection Agency.



Stacy Charboneau
Manager
U. S. Department of Energy
Richland Operations Office



Date

May 2016

Signature sheet for the *Explanation of Significant Differences for the 1999 Amended Record of Decision for the K Basins* between the U.S. Department of Energy and the U.S. Environmental Protection Agency.



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U. S. Environmental Protection Agency, Region 10

5/31/16
Date